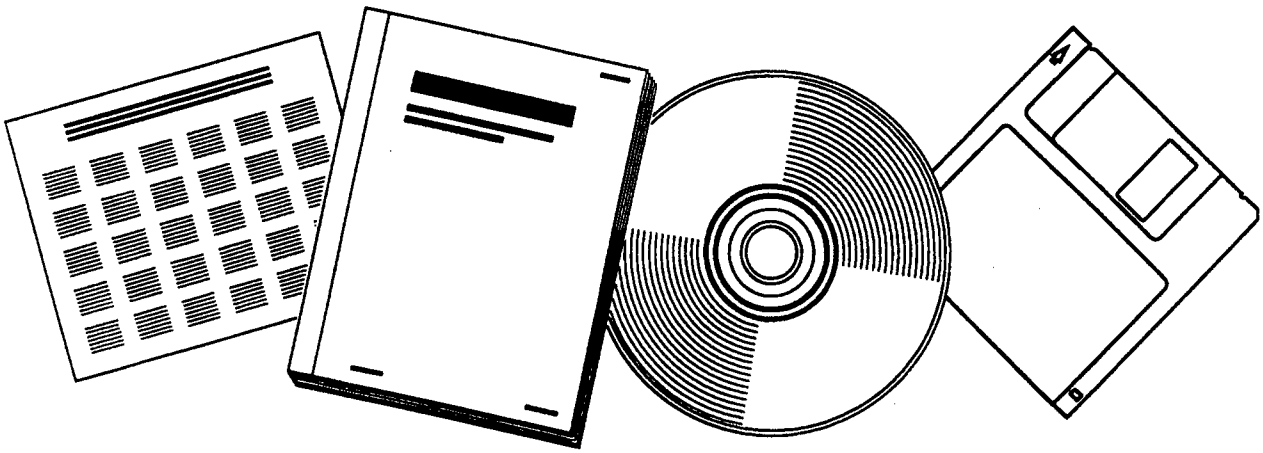
PB98-110984

Information is our business.

EVALUATION OF DESIGN BUILD PRACTICE COLORADO IR(CX)70-4(143)

NOV 97



U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

Report No. CDOT-DTD-R-97-7

PB98-110984

Evaluation of Design Build Practice in Colorado IR(CX)70-4(143)

Ahmad Ardani
Bernnie Guevara
William Scheuerman
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado 80222

Pre-Construction Report
November, 1997

Prepared in cooperation with the
U.S. Department of Transportation
Federal Highway Administration

REPRODUCED BY: NTIS
U.S. Department of Commerce
National Technical Information Service
Springfield, Virginia 22161

REPORT DOCUMENTATION PAGE

FORM APPROVED
OMB NO. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response,including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed , and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	November 1997	Pre-construction Report

4. TITLE AND SUBTITLE
Evaluation of Design Build Practice in Colorado, IR(CX)70-4(143)

5. FUNDING NUMBERS
23.00

6. AUTHORS(S)
Ahmad Ardani, Bernnie Guevara, William Scheuerman

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(S)
Colorado Department of Transportation
4201 E. Arkansas Ave.
Denver, Colorado 80222

8. PERFORMING ORGANIZATION REPORT NUMBER
CDOT-DTD-R-97-7

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(S)
Colorado Department of Transportation
4201 E. Arkansas Ave.
Denver, Colorado 80222

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
Prepared in Cooperation with the U.S. Department of Transportation, Federal Highway Administration

12a. DISTRIBUTION/AVAILABILITY STATEMENT
No Restrictions: This report is available to the public through the National Technical Information Service, Springfield, VA 22161

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This report summarizes the pre-construction activities of the design-build project in Region I. Included in the report is an overview of the design-build concept and a description of the procedure used to advertise, evaluate technical proposals, and to select the contractor.

FHWA approved the design-build concept to be used for the I-70 reconstruction project under the Special Experimental Project No.14 (SEP 14), "Innovative Contracting Practices." CDOT has established a task force to investigate the effectiveness of using design-build for this project. The ultimate goal of this investigation is to identify and document the pros and cons of the design-build practice and its overall applicability to CDOT.

14. SUBJECT TERMS
Innovative Contracting
Design-Build
Technical Proposals

15. NUMBER OF PAGES
26

16. PRICE CODE

17. SECURTITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	

Table of Contents

Section		Page No.
	Disclaimer	i
	Abstract	ii
	Table of Contents	iii
I.	Background	1
II.	Research Objectives	4
III.	CDOT's Design-Build Manual	4
IV.	Design-build Project	5
	A. Project Description, Scope of work	5
	B. Advertisement (Request for proposal)	6
	C. Proposal Requirements	7
	1. Technical & Price Proposal	7
	2. DBE Goals	9
	3. Subcontracting Requirements	10
	4. Warranties	10
	5. Quality Control	10
	D. Miscellaneous	11
	1. Right-of-Way	11
	2. Environmental Impact Studies	11
	3. Utilities	12
	4. Value Engineering	12
	5. Stipends	12
	E. Award and Execution of Contract	13
	R. questionnaire	14
V.	Conclusions and Recommendations	14
VI.	References	17

Design-Build Project

IR(CX))70-4(143), # 90023

I-70, Airpark Road East

Present Status: Preconstruction Phase

I. Background

Region I of the Colorado Department of Transportation (CDOT) awarded its first ever design-build contract under the FHWA's pilot program, called the Special Experimental Project 14 (SEP 14). Presently, the "**design-bid-build**" is the primary method used by CDOT to select contractors. Under the design-bid-build, CDOT would design the project in-house or by a hired consultant. The project is then advertised and awarded to the lowest bidder. Under this method, the construction begins only when all designs are completed.

The "**design-build**" method, on the other hand, combines both the design and construction phases of a project into a single contract and allows for overlapping of some design and construction. In essence, construction can begin before all designs for a project have been completed. Under the design-build method of contracting, the owner (highway agencies) identifies the project's desired end result product. The prospective bidders are then provided with 5 to 30 percent of the design, including **mandatory requirements** and are asked to prepare a technical proposal and a price proposal showing how they intend to complete the remaining design and the entire construction.

The submitted proposals are then reviewed and rated by a Technical Review Committee (TRC). Typically, four major criteria are used in the selection process:

- Cost of the project
- Quality of the proposed design/Innovations
- Management capability of the bidder
- Time required to complete the entire project

In general, the contract will be awarded to a proposer who provides the **best value offer.** The best value offer may not necessarily be the lowest bid. For example, for the Utah's $1.4 billion design-build project (reconstruction of the I-15 corridor) the Utah Department of Transportation (UDOT) awarded the contract to the proposer who provided the best value offer to UDOT considering not only the price, but other factors such as design quality, timeliness, and management capability.

According to a 1997 FHWA report, Innovative Practices Using Design-Build Contracting (1), the design-build contracting method offer three major benefits. First of all, the contracting agency (owner) will have to deal with only one party for the quality, cost and the overall management of a project. This reduces the owner's responsibility of coordinating activities between the designer and the builder. At the same time this diminishes project administration due to the transfer of roles to the contractor and designer.

Second, When the designer and the builder are jointly responsible for the overall quality of the final product, the potential for dispute and litigation between them is diminished (2).

Finally, overlapping some design and construction can result in time savings which eventually can translate into cost savings for both the traveling public and the contracting agency.

The CDOT's traditional low bid process has worked well in the past and still desirable for a wide range of projects. However, where there is a time constraint, especially for large projects, the design-build concept can become an attractive alternative over the traditional low bid method since one of its main attributes is reduction of the total design/construction time.

According to a FHWA Report (Reference 1), there is a considerable interest in design-build contracting. As of January 1997, 13 states had initiated over 50 design-build projects. This report also indicated that existing procurement laws of 17 states including Colorado do not permit the use of combined design and construction contracts. Recently UDOT let the largest ever design-build contract in the amount of 1.4 billion dollars. According to UDOT officials, the design-build method will reduce the overall project's duration by as much as 3 years and allows UDOT to complete the project prior to hosting the 2002 Winter Olympics in Salt Lake City.

Utah legislators amended their procurement laws allowing UDOT the use of deign-build. Traditional contracting would have taken a tremendous coordination of multiple projects and extended delivery period for completion (3). According to Mr. Roy Nelson of FHWA Utah Division, the adoption of design-build allows UDOT to meet schedules, reduces the potential for legal disputes and minimizes disruptions to the traveling public. In addition, it allows UDOT to benefit from several design and construction

innovations and value engineering features.

II. Research Objective

The primary objectives of this research study is to identify and document the pros and cons of the design-build practice and examine its overall applicability to CDOT. To satisfy these objectives and the requirement of the FHWA's SEP 14, the research team for this study established the following milestones:

1- 90 days after the design/build contract is awarded a report will be issued to discuss the procedure used to select the successful bidder and to reveal the reactions of contractors and consultants on the Design-Build concept.

2- Interim reports will be prepared on an annual basis or as needed to discuss progress to date, significant events and encountered problems.

3- A final report will be issued 90 days after the completion of the entire project. This report will identify the merits and limitations of the design build concept using the criteria established in the work plan (see appendix A).

III. CDOT's Design-Build Manual

CDOT, in cooperation with Federal Highway Administration (FHWA), the American Consulting Engineers Council of Colorado and the Colorado Contractors Association developed a set of comprehensive guidelines, "**Design-Build Manual**" (4) to be used for CDOT's design-build projects. These guidelines are compatible with the Current CDOT's policy of awarding contracts to the *lowest*

responsive and responsible bidder. For a complete review of these guidelines refer to CDOT's Design-Build Manual.

IV. Design-Build Project IR(cx)070-3(143)

A. Project Description & Scope of Work

The subject project is located on interstate 70, between mileposts 290-302, approximately 20 miles east of Denver. The project calls for completion of the remaining design and the entire reconstruction of 12 miles of I-70 from Airpark Road, east to Bennett. Overall, the project requires addressing the following 19 salient features:

1- Traffic control design plans and phasing details
2- Bridge design plans
3- Roadway and hydraulic design plans
4- Hot bituminous pavement bond-breaker
5- Permanent pavement marking
6- Detours
7- Construction traffic control
8- Permanent signing
9- Structures (Bridges, Box Culverts, drainage pipes,)
10- Concrete overlay
11- lighting
12- Guardrail, bridge rail, median barrier, end anchorages
13- Seeding and mulching
14- Erosion control (storm water management plan)
15- Permits
16- Earthwork
17- Surveying
18- Fencing
19- Mobilization

B. Advertisement (Request for Proposals)

Traditionally, CDOT advertise all construction projects in a statewide business journal called, the "**Daily Journal**". Concurrently, these projects are advertised electronically in CompuServe which is an on line service to notify pre-qualified Colorado contractors. In addition to the above two methods and in an effort to generate more interest and solicit more bids, the Region I design-build project was also pre-advertised in a national engineering magazine called, Engineering News Record (ENR). The ENR notice (refer to Appendix B) was published approximately one month prior to the formal advertisement in the Daily Journal and on CompuServe.

Prior to advertising the project, a few meetings were held with the contracting and consulting firms in order to acquaint them with the scope of work, address their comments and to acquire their feedback. The following is the list of activities that took place in the advertisement and overall procurement process:

• Meeting with the ACPA officials	Jan 30
• Preliminary review meeting with design-build teams	Mar 21
• Project was formally advertised	Apr 03
• Pre-Bid conference	Apr 17
• Bid opening	May 22
• Oral presentation by the winning team to address the TRC's comments	May 29
• Award of contract	Jun 03
• Notice to proceed	Jun 23

Note: *Typically, CDOT provides a 3-week ad period for the traditional design-bid-build Projects. However, for this design-build project, the ad period was extended to six weeks to allow the proposers to establish teams. For future design-build projects, the ad period may be extended beyond the six weeks period for Field Inspection and Review (FIR) plans of less than 20 percent Complete.*

C. Proposal requirements:

1. Technical & Price Proposal

Altogether, a total of 37 bidding packages at a cost of $50 per package were disseminated to the interested proposers across the country. The bidding packages provided the proposers with approximately 30 percent of the design, including a complete survey for the western six miles of the project and a minimal survey for the remaining portion of the project.

The proposers were then asked to prepare a technical proposal and a price proposal showing how they intend to complete the remaining design and the entire construction. Included in the bidding package were numerous **mandatory requirements**, such as the preference for concrete pavement over flexible pavement, and special bridge and lighting requirements.

In general, the design-build project required the proposers to show a lump sum cost for all the 19 salient features listed above in section IV of this report. In addition to the normal requirement of pre-qualification for the contractor, the technical proposals were also required to clearly demonstrate the

qualification of the design team. Overall, the design team was required to demonstrate the following ***minimum qualifications:***

a) pre-qualification of the design team by CDOT.
b) Evidence of an errors & omissions insurance not less than $1,000,000.00.
C) Proof of successful completion of the design of one interstate project or multi-lanes divided freeway having construction or reconstruction costs in excess of $5,000,000.00 over the last 5 years.

Only two local Colorado firms submitted technical proposals for this project, **Interstate Highway Construction (IHC)** and **Castle Rock Construction Company (CRCC).** A Technical Review Committee (TRC) consisting of the Region's Construction, Materials and Design personnel was assembled to review the technical proposal of the apparent low bidder, IHC. This committee was charged with the task of assessing the overall responsiveness of the lowest bidder's technical proposal and ensuring that all the requirements of the bidding package were addressed.

Contract award was contingent upon IHC adequately addressing any issues and concerns raised by the TRC. Overall, nine questions were raised by the TRC and they were all adequately responded to by IHC. The TRC would have considered reviewing the CRCC's technical proposal if the IHC's technical proposal had been determined to be non-responsive.

It is important to note that the "best value" concept which is

used in typical design-build projects was not incorporated into this project. For CDOT's design-build project, cost was the primary consideration, subject to a responsive/responsibility determination. Because the IHC was able to meet all criteria for award, there was no need for the TRC to consider the CRCC's technical proposal. Under the best value method of awarding contracts, all the submitted technical proposals are reviewed and the contract is awarded not necessarily to the lowest bidder, but to the proposer who provides the best value offer, considering not only the price, but other factors such as design quality, timeliness, and management capability.

It is the general consensus that best value concept encourages innovation and promotes value engineering features by allowing the contractors to optimize their work force, equipment, and schedules. In reality, the best value concept can be referred to as reaching a balance between quality, time and price.

As mentioned earlier, the procurement laws of Colorado does not allow such contracting practices yet. Awarding contracts to the lowest responsive and responsible bidder still prevails in Colorado as it did for this design-build project.

2. Disadvantage Business Enterprise (DBE) Goals

The contract goal for the DBE participation was established at 10 percent of the total contract amount. The Equal Employment Opportunity Representative (EEO Reps) in Region I worked closely with the Design Engineer to review items that were likely to be on this project and determined the DBE goals based on the total amount of the contract. The contractor was requested to submit documentation demonstrating how they intend to satisfy the DBE

participation goals.

In the event that contractor is unable to meet the requirements of DBE goals, the contractor is then required to submit a **good-faith-effort** documentation, demonstrating their effort. The good faith effort documentation is analyzed by a review committee and is sent to the Chief Engineer for approval. In general, the contractor is required to meet the requirements of CDOT's form 718 for the good-faith-effort.

3. Subcontracting Requirements

Subcontracting was allowed in accordance with the Current CDOT requirements. Presently, CDOT requires the prime contractor to perform at least 50 percent of the total contract.

4. Warranties

No warranties were required for this Project. The Federal Highway Administration (FHWA) regulations, "23 CFR 635.413" no longer prohibits the use of warranties on National Highway System (NHS). However, to use warranties on NHS, transportation agencies are required to acquire an advance approval by the FHWA's Division Administrator (5). In addition, it is the FHWA's position that warranty clauses shall be used only for specific items and shall not place undue burden on the contractor.

Long-term maintenance and warranties were an essential part of the Utah's 1.4 billion dollar design-build project. During the 1998 construction season, CDOT will initiate a study to evaluate the use of warranty clauses in three pilot projects.

5. *Quality Control (QC)*

The contractor was required to develop a quality control plan, clearly demonstrating the frequency of testing and sampling, qualification of the testing personnel, and reporting procedures. Incentive/disincentive clauses were incorporated into the contract in accordance with CDOT's procedures. Quality assurance (QA) remains the responsibility of CDOT's project personnel.

D. Miscellaneous

1. *Right-of-way*

The existing right-of-way was clearly identified in the plans prior to advertising the project. The original design did not anticipate acquisition of new right-of-way. The contractor was not permitted to perform any project related work outside the existing right-of-way, without prior approval by CDOT. where the contractor was obligated to obtain temporary easements to facilitate their work, written CDOT's concurrence was required. In such instances, the contractor was solely responsible for all costs, environmental clearances and other permits required for the easements.

2. *Environmental Impact Studies*

The environmental clearances for the existing right-of-way were obtained by CDOT. The contractor is required to identify any new right-of-way, staging areas, borrow areas, and stockpile locations early in the design stage. CDOT will then obtain clearances for these areas.

Two wetlands were identified for this project. If due to the

design more wetland areas are located, the contractor is required to avoid impacting them. Nevertheless, if the impacts are unavoidable, they are required to be mitigated on a 1:1 ratio. CDOT will assist the contractor on wetland mitigation and obtaining the required permits. However, the contractor is not allowed to perform any earthwork until the permits have been obtained by CDOT.

3. Utilities

No major utility conflicts were identified on this project. Known existing utilities within the project limits were identified and are listed on the plan and profile sheets.

4. Value Engineering

At the preliminary stages of the project development, it was believed that *value engineering (VE) clause,* had no place in the design-build projects with *mandatory requirements.* However, further into the project development it was realized that even design-build projects with mandatory requirements can be subjected to contractors' value engineering analysis. Since the existing standard VE specification could not be used, the UDOT's VE specification for the I-15 design-build project provided by FHWA was used as a guide on this project.

A value engineering feature submitted by the contractor was incorporated into this project by a *contract modification order (CMO).* The savings form This VE feature, amounted to approximately $250,000, which will be divided between CDOT and the contractor.

5. Stipends

Full or partial payment of stipend to the unsuccessful proposers were not allowed for this design-build project. In essence, bidders who performed design work prior to the award, but were not awarded the project, have performed that work solely at their own cost. This prove to be a serious hardship for some of the proposers.

Potential bidders indicated to the Project Engineer that the cost of preparing the bid was increased by about 300 to 400 percent compare to regular design-bid-build projects. The cost was estimated to be in the range of $100,000 to $150,000. Some of the subcontractors expressed concern that high cost associated with their bid preparation prevented them from participating in the bids.

There are still ongoing discussions as to the cost-effectiveness of providing stipends to the unsuccessful bidders. It is UDOT's position that payment of stipend to the unsuccessful proposers allowed them access to their innovations which could in turn be applied to the project. The stipend also provided UDOT with competitive price proposals and overall improved project quality and delivery. UDOT reimbursed the two unsuccessful proposers a stipend in the amount of $950,000 each to cover a portion of their proposal preparation cost (approximately 50 percent).

E. Award and Execution of Contract

The apparent low bidder was the Interstate Highway Construction of Englewood, Colorado, with a bid of $25,919,163. Castle Rock Company of Castle Rock, Colorado, submitted the second lowest bid

in the amount of $26,870,000. The engineer's estimate was at $26,600,000. A seven calendar day extension was granted to IHC to resubmit their proposal incorporating the TRC's Comments. The contract was awarded to IHC as the lowest responsive and responsible bidder on June 3, 1997.

Notice to proceed was issued on June 23, 1997.

F. Questionnaire

A questionnaire was developed by the study panel and disseminated to the design/construction teams at a pre-bid conference on April 17, 1997 (Appendix C). The ultimate goal of this questionnaire was to acquire feedback from the consultants and contractors on overall concept of design-build methodology. The recipients were asked to complete the questionnaires and returned them to the research team by June 30, 1997. However, so far the response has been less than enthusiastic and none have been returned.

The research team believes that feedback from the design and contracting agencies will be an important part of the future development of the design-build practice. Therefore, they are determined to schedule interviews with individual designer and contractor in the near future. The results of these interviews will be presented as part of the upcoming interim report.

IV. Conclusions and Recommendations

Based on the literature reviewed and the result of the pre-construction phase of the CDOT's Region I design-build project, the following conclusions and recommendations are presented:

- CDOT's traditional design-bid-build has worked well in the

past and is still applicable for a wide range of projects. However, where there is time constraint, the design-build concept can be used as a tool to reduce the total design/construction time and meet deadlines.

- Ideally, environmental clearances, right-of-way acquisition, utility relocation and coordination should be done by the contracting agency. The time required for these items would nullify the time savings otherwise achieved by the design-build contracts.

- The procurement laws of Colorado may need to be amended, in order for CDOT to take full advantage of what the design-build concept can offer. Awarding contracts to the lowest responsive and responsible bidder still prevails in Colorado as it did for this design-build project.

- When a balance of time, quality and price is desired, the *"Best Value Offer"* may be more cost-effective than the lowest bid, since it encourages innovations and allows the contractors to optimize their work force, equipment, and schedules.

- Warranty clauses, coupled with design-build concept can provide contracting agencies with added insurance that they are getting quality products that last their design-life. During the 1998 construction season, CDOT will initiate a study to examine the functional practicability and cost-effectiveness of warranties in three pilot projects.

CDOT will continue monitoring the progress of this design-build project over the next 15 months. A final report documenting the results will be published at the completion of the project.

VI. References

1- GAO/T-RCED-97-83,"Prospects for Innovation Through Research, Intelligent Transportation Systems, State Infrastructure Banks, and Design-Build Contracting", March 6, 1997.

2- GAO/RCED-97-138R, "Surface Transportation" State Are Experimenting with Design-Build Contracting, April 29, 1997.

3- Nelson, Roy, "Utah's I-15 Design-Build Project, Preconstruction Phase", June 1997.

4- Colorado Department of Transportation, "Design-Build Manual", August 1997.

5- NCHRP Synthesis 195, "Use of Warranties in Road Construction", December 1994.

6- "FHWA Initiatives to Encourage Quality Through Innovative Contracting Practices", September 1996.

Appendix A

INNOVATIVE CONTRACTING PRACT. .S
SPECIAL EXPERIMENTAL PROJECT NO. 14

COLORADO PROJECT NO. IR(CX) 070-3(143)
AIRPARK ROAD - EAST
WORK PLAN

I. INTRODUCTION

A. The Project

The Colorado Department of Transportation proposes to procure both the design and construction of Interstate 70 east of Denver with a single contract. The Project is one of the components of the reconstruction of the concrete pavement from Denver to Limon. A narrative Project summary and location map is included as Appendix A.

B. Approach and Scope of this Proposal and Work Plan

The nature of this Project, along with critical overall time windows, make it an ideal candidate for design/build contracting. This proposed Work Plan will:

- Describe the innovations CDOT proposes to use
- Outline the currently planned project time line
- Describe the parameters planned for evaluation
- Describe the proposed evaluation methods
- Describe the reports proposed to document the evaluation

II. PURPOSE/DESCRIPTION

A. The innovations to be Evaluated

This will be CDOT's first use of design/build for a full scale highway project. Thus it will be an excellent opportunity to directly evaluate the methods of design/build for Colorado highway projects.

CDOT will be able to evaluate the administrative and institutional impacts of this type of project delivery system (much of this information will be gained by analyzing competitive proposals for the combined design and construction effort). In addition,, CDOT can review the staff and consultant resources required during the initial development of the bid in comparison with design and construction cost savings that are anticipated to be achieved with the use of design/build.

Additionally, many of the technical aspects of the concrete reconstruction have the potential for design and construction innovations by the contractor. Also meriting careful evaluation is how well the single-point responsibility of the design/build contracting process, which is based substantially on performance specifications, can help CDOT meet the goals of reduced cost, accelerated schedule, and quality product.

Finally, CDOT proposes an incentive/disincentive requirement that is intended to enhance the quality of the final product and result in a long term cost control and savings benefit.

B. Specific Items to be Evaluated

1. Confirm or refute generally held beliefs regarding design/build. Available experiential data and generally recognized construction industry sources say that design/build is advantageous and preferable to design/bid/build in terms of the following factors:

- Reducing project delivery time
- Reducing change orders and claims and therefore additional contractor compensation
- Reducing total project costs
- Enhancing quality
- Providing user satisfaction
- Stimulating innovation
- Permitting flexibility in designs, materials, and methods

CDOT proposes to evaluate each of these measures within the framework discussed in Section V below.

2. Effectiveness of Design/Build Methodology. There are specific procurement and contracting methodologies that will be applied in the design/build process.

CDOT proposes to evaluate their effectiveness, These items include:

- The contractor selection process, such as the appropriateness of the criteria, the response of the contracting community, and the competitiveness of the proposals.

- Coordination of technical disciplines and trades in a highway project that features extensive roadway and bridge design and construction.

- Extensive use of performance specification

- A low bid award approach

3. Product improvement through incentive/disincentive payments. Final product performance and construction phasing will be enhanced by providing the design/build contractor incentives to provide quality materials in the completed facility with the least disruption to the traveling public.

III. SCOPE

A. Low Bid Approach

CDOT has selected this project for design/build, contingent on FHWA approval, because it will be advantageous to the State. The CDOT Draft Design/Build guideline is attached to this Proposal as Appendix B. However, this project does not follow all criteria outlined in the draft version. Much of the design/build contractor's effort will be defined by performance specifications. Appendix C contains the current, near final, specifications for this design/build project.

CDOT presently envisions inviting interested design/build contractors and teams to obtain preliminary plans and survey data. All contractors interested in bidding on the contract must be on CDOT's prequalified list. The prequalification criteria will be the same as currently used for contractors including bonding criteria. CDOT believes the bonding companies will scrutinize the ability of the Contractor to perform and complete the work to a much greater extent than CDOT could achieve. The design/build contractors/teams will then be invited to a pre-bid conference, and subsequently will be asked to submit technical and price proposals. The specifications will include such items as the qualifications of the designer member of the team, the financial standing of the contractor, and the design/builders understanding of this design/build project. Failure to meet the minimum criteria will result in disqualification of the bid.

CDOT's will also evaluate whether to include time of contract performance as a proposal evaluation factor. Following project completion the design/build contractor will participate in a detailed debriefing and retrospective evaluation. The contractor will be specifically queried as to how cost, time, and quality could be further enhanced on future design/build projects.

B. Physical Description

The project is described in narrative and graphic form in Appendix A.

Anticipated cost for the improvements is $30 million. This estimate is based on the engineering and economic data known to CDOT at this time.

IV. SCHEDULE

CDOT has set the goal of opening the new facility in October, 1998. To meet this opening deadline, CDOT has established the following milestones for the Project:

Preliminary Notice for interest	February 1997
Advertise Project officially	April 1997
Pre-bid Conference	April 1997
Receive proposals (Bid Opening)	May 1997
Award Contract	June 1997
Project Open to Traffic	October 1998

V. MEASURES

Following is an item-by-item summary of the baseline condition or standard, and the criteria or description for measurement of project performance.

Parameter	Baseline	This Project
Total design and construction time	Objective current estimate for design/bid/build based on past experience for projects of comparable size and complexity	Elapsed time from award of consultant contract to substantial completion of construction
Change orders and claims	Expected percent of change orders and claims based on past CDOT experience	Actual percent of change orders and claims
Total project cost	Objective current estimate of design cost, construction contractor cost, and CDOT internal cost for design/bid/build	Actual total of consultant cost, design/builder cost, and CDOT internal cost
Quality	Agency experience with comparable projects	Assessment by CDOT and consultant as to whether quality is better, equal, or less than would reasonably be attainable via design/bid/build

Parameter	Baseline	This Project
User satisfaction	Agency experience with comparable projects	Under study; may not be susceptible of immediate realistic evaluation
Stimulation of innovation; Flexibility in design, materials, and methods	Agency and consultant knowledge of comparable projects	Post construction identification of design and construction innovations; including contractor debriefing
Design/builder selection process	Not applicable	Subjective post- construction evaluation to address: 1) Did the process select truly qualified design builders? 2) Did the process promote competition? 3) What was the response of the contractors' community? 4) Should there be changes to the criteria or weighting factors for future procurements?
Coordination of disciplines and trades	Agency and consultant experience with comparable projects	Subjective post construction evaluation: Was CDOT (and its consultant) able to avoid involvement in interdisciplinary coordination and disputes?
Performance specifications	Not applicable	Subjective post-construction evaluation including contractor debriefing: 1) Which performance specifications were feasible? 2) Which performance specifications were effective?
Best value procurement	Not applicable	Was the price-quality-time combination applied for this project appropriate?
Overall design/build process	Not applicable	What should be changed and what should be retained if CDOT were to use design/build on future projects? Are there time savings that are of particular value to states with short construction seasons?

VI. REPORTING

Three reports will be prepared for evaluation purposes. These reports are as follows:

Initial Report - The initial report will be prepared within 90 days after the design/build contract is awarded. The report will include a comparison of proposals received to design proposals and construction bids under a conventional design/bid/build; a discussion of differences in the proposals; documented reactions of the industry to the process; a description of the procedure used to select the contractor; and a discussion of any problems or issues that have developed as a result of the design/build process.

Interim Report - Interim reports will be submitted annually and in the event of a significant development related to the design/build process The annual interim reports will include project progress to date, design/build problems or issues, and a comparison of the current project status compared to the project status using a conventional design/bid/build process.

Final Construction Report - An interim final report will be prepared within 90 days after the completion of the initial project performance testing. This report will provide an evaluation of the design/build process as applied to this project. The project will also be evaluated using appropriate sections of the criteria established in the MEASURES section of this proposal. Recommendations for future use of the design/build process will also be included in the report. The report will summarize what should be retained, what should be improved, and what should be discarded for future projects.

. HWA SPECIAL EXPERIMENTAL PROJECT NO. 14
APPENDIX A

FEDERAL AID PROJECT
IR(CX)070-3(143)
AIRPARK ROAD - EAST

NARRATIVE PROJECT BACKGROUND/PURPOSE/DESCRIPTION

Project IR(CX)070-3(143) is a reconstruction project on Interstate 70 located approximately 5 miles east of Denver in Arapahoe County. It begins at MP 290 and extends 12 miles easterly near Bennett interchange.

Construction work consists of concrete overlay. Pavement thickness from 12.5" to 13.5" (min.) as shown shall be placed. HBP bond breaker or complete removal of existing pavement shall be performed as required. Other major work includes interchange modifications, side slope flattening (i.e. clear zone requirements), reshaping of median slopes, traffic detours, traffic control, highway lighting, guardrails, signing, minor structures, drainage, landscaping, surveying, and erosion control.

A minor variance will be requested to eliminate the requirement of reconstructing the vertical curves which do not meet 75 mph criteria for stopping sight distance but exceed 60 mph requirements.

Design work includes preparation of a complete set of plans and specifications. This includes design calculations, documentation, permits application and processing, shop drawings, and all other plans, specifications and documentation necessary to complete the project.

This project will be paid on Lump Sum basis. Lump Sum payment includes all work required to complete the Design and all necessary labor, equipment and materials needed to complete construction of the project. Interim payments will be processed by the Engineer based on percent completion of design and construction.

The Department will provide an initial set of plans and specifications to be used by the Contractor as a guideline in preparing his plans and specifications, construction methods and bid proposal. Further design information will be provided as indicated in the specifications. The Department will also perform Quality Assurance Testing. All material testing shall be in conformance with CDOT's Materials Manual.

At the completion of the project, the Contractor shall submit an As Built set of plans.

Appendix B

CLASSIFIEDS

Colorado Design/Build Project

The Colorado Department of Transportation (CDOT) is proposing to advertise, on or about April 3, 1997, a design/build project [IR (CX) 070-3(143)] to reconstruct 12 miles of Interstate 70 east of Denver in Arapahoe County (approximate MP 290 to MP 302). The design/build project consists of complete reconstruction of the existing four lane freeway to current design standards. In addition, an adjacent 8 mile section of interstate 70 [project IM 0704-(178) approximate MP 302 to MP 310] will be advertised for reconstruction on or about March 20, 1997. The (178) project includes design/build features if the contractor does not elect to utilize the CDOT default design. Preliminary plans and survey information (in electronic form) for both projects will be provided to interested parties on or about March 1, 1997. It is important to note that the plan data is subject to change up to the official ad date; however, the survey data is in its final form. The Contract award(s) for both projects is currently scheduled for June 1997 with anticipated project completion in October 1998. The current budgets are: $30,000,000 and $15,000,000 for the design/build project and the (178) project respectively.

For additional information about the projects, please contact Joe Tasset at (303) 757-9647 or Bill Scheuerman at (303) 757-9130 or Internet E-mail at william.scheuerman@dot.state.co.us.

Department of Environmental Protection
Bureau of Environmental Engineering
Notice to Bidders

WP-269 Bowery Bay Water Pollution Control Plant

Reconstruction and Improvement of Main, North and South Pumping Stations on Roosevelt Island

- Contract 133G - Structures and Equipment
- Contract 133E - Electrical Work
- Contract 133H - HVAC Work
- Contract 133P - Plumbing Work

Separate sealed bids for the above Contracts will be received by:

Department of Environmental Protection
Office of Procurement
Contract Management Division
59-17 Junction Boulevard, 17th Floor
Elmhurst, New York 11373
Telephone (718) 595-3223

until April 2, 1997, 11:30 A.M. at which time and place, bids will be publicly opened and read.

The contractor shall furnish, deliver, install, test and place into satisfactory operation all equipment, materials, devices and structures described in the specifications, as shown on the drawings, as directed by the Engineer and in accordance with the obvious or expressed intent of the contract.

Contract documents may be obtained from the Contract Division by depositing a $100 certified check, money order or cashier's check, payable to the Department of Environmental Protection for each set of documents so obtained. There will be no refund of monies received for bids, plans, specifications, etc., so obtained.

A tour inspection will be held at 10:00 A.M. on March 18, 1997 at the Main Pumping Station located within the AVAC building on Roosevelt Island which is located in the Borough of Manhattan. The Main Pumping Station is located on the contract drawings.

A pre-bid conference will be held at 2:00 P.M. on March 18, 1997 at 59-07 Junction Boulevard, 6th Floor Training Room (High-rise building), Corona, New York 11368.

Prospective bidders are encouraged to submit all questions, in writing, prior to the pre-bid conference, to Paul D. Smith, P.E., Chief, Facilities Design North, Bureau of Environmental Engineering, Department of Environmental Protection, 96-05 Horace Harding Expressway, Elmhurst, New York 11373-5107.

These contracts will be subject to regulations contained in 40 CFR Part 33 of the USEPA rules and regulations as published in the Federal Register on March 28, 1983, Vol. 48, No. 60. The City of New York is a participant of the goal-oriented Minority Business Enterprise (MBE) Program, as well as the Women's Business Enterprise (WBE) Program.

Prospective bidders are advised to examine Bid Specification Article 58A, tax exemption, so that the bid does not include exempted taxes.

PRC Environmental Management, Inc.
Amendment No. 1
Invitation for Bid (IFB) No. CH972766
Peerless Plating Soil Remediation, Muskegon, Michigan

Please be advised that the March 3, 1997 ad for subject IFB is hereby amended. The requirement for disposing of approximately 6,500 cubic yards of contaminated soil is changed to 1,500 cubic yards. The estimated price range is between $0.5 million and $1.5 million. The prebid conference is changed to April 1, 1997. The bid opening is changed to April 15, 1997. Also, a copy of the bid documents will be available for inspection after March 17, 1997.

Massachusetts Water Resources Authority
Seeks Information on Remote Monitoring and Control

Companies which develop, manufacture, and/or provide equipment, software, or consulting services used to plan, design, or implement remote systems for monitoring (operations and/or maintenance) and/or controlling wastewater pumping station and CSO facilities are invited to make a presentation within the months of April through June 1997. Interested firms must request a copy of the presentation guidelines from Brian Kubaska or Derek Barnes at (617) 242-0230 through March 28, 1997. Be advised that presentations are for informational purposes only and do not commit the Authority to purchasing any equipment, software or services.

Why Advertise Your Projects in

ENR
Engineering News-Record

?

The cost of advertising your project in ENR is small compared to the cost of your project. The cost of not attracting the right bidder is too great to measure.

WEST COAST & MOUNTAIN STATES

Cherie Jolley
Tel. 801-974-2843
Fax. 801-972-9409

EAST COAST SOUTHEAST, MIDWEST & INTERNATIONAL

Mark Montimurro
Tel. 212-512-2422
Fax. 212-512-2074

Appendix C

Colorado Department of Transportation
Task Force 23.00

Design-Build Contracts
Questionnaire

Name of Respondent: ----------

Firm: ----------

Title: ----------

Address:----------

Telephone/Fax No: ----------

The Colorado Department of Transportation (CDOT) has established a task force to investigate the use of the current design-build method being used for the reconstruction of 12 miles of I-70 east of Denver. The ultimate goal of this investigation is to identify and document pros and cons of design-build practice and also to acquire feedback from the contractors, consultants, and selected CDOT personnel.

We believe your feedback will be an important part of the future development of design-build methodology. The following questionnaire is included for this purpose. Your cooperation in completing the questionnaire by October 15, 1997 will be greatly appreciated. Please return the completed questionnaire and any supporting materials to:

Ahmad Ardani
Colorado Department of Transportation
Research Branch
4201 East Arkansas Ave, Rm A-100
Denver, Colorado 80222

If you have any questions regarding this survey, please call Ahmad Ardani at (303) 757-9978.

THANK YOU FOR YOUR VALUABLE ASSISTANCE ON THIS PROJECT
We will inform you of the results of this survey

please write on the back pages, If you require more space for your response.

Design/Build Practices

Questionnaire

1. How familiar are you with the concept of Design/Build? Have you ever been involved in such contracts? Please describe your experience and involvement in past design-build contracts.

---

2. The proponents of the design-build concept claim the following advantages. Which ones do you agree with?

-Lowering overall agency cost	------Yes	------No
-Reducing total design/const. time	------Yes	------No
-Improve finished product	------Yes	------No
-Promote innovation	------Yes	------No
-Reduce claims	------Yes	------No
-Reduce CMOs	------Yes	------No
-Reduce motorist delays	------Yes	------No

Comments:----------

---

3. In your opinion what are the adverse impacts (disadvantages) of using design-build contracts? Please explain.

---

4. Do you feel some types of projects are more suitable candidates for design-build contracts? If so, which types? Did you consider any other types of contracting techniques, i.e, A+B, Lane Rental, etc.

---

5. In the design-build option, do you believe a warranty should be established to improve project quality and reliability? If the answer is yes please indicate what project features should be warranted and what should be a cost-effective warranty period? Please explain.

---

6. Would smaller companies be at advantage or disadvantage using the design-build method?

---

7. What potential benefits, if any, does your company expect from the design-build process?

---

8. Do you feel that the relative risks associated with the design-build process have been equitably shared among owner, designer and builder? Please explain

---

---

9. Was the level of details provided adequate for the following items:

- Environmental ------Yes ------No
- Survey ------Yes ------No
- Plans& details ------Yes ------No
- Specification ------Yes ------No
- Bridge ------Yes -----No

Comments:----------

---

10. What are your major concerns about the use of design-build?

---

11. what changes would you recommend to improve the design-build process?

---

12. Would you participate in another design-build contract?

NTIS does not permit return of items for credit or refund. A replacement will be provided if an error is made in filling your order, if the item was received in damaged condition, or if the item is defective.

Reproduced by NTIS

National Technical Information Service
Springfield, VA 22161

This report was printed specifically for your order from nearly 3 million titles available in our collection.

For economy and efficiency, NTIS does not maintain stock of its vast collection of technical reports. Rather, most documents are printed for each order. Documents that are not in electronic format are reproduced from master archival copies and are the best possible reproductions available. If you have any questions concerning this document or any order you have placed with NTIS, please call our Customer Service Department at (703) 605-6050.

About NTIS

NTIS collects scientific, technical, engineering, and business related information — then organizes, maintains, and disseminates that information in a variety of formats — from microfiche to online services. The NTIS collection of nearly 3 million titles includes reports describing research conducted or sponsored by federal agencies and their contractors; statistical and business information; U.S. military publications; multimedia/training products; computer software and electronic databases developed by federal agencies; training tools; and technical reports prepared by research organizations worldwide. Approximately 100,000 *new* titles are added and indexed into the NTIS collection annually.

For more information about NTIS products and services, call NTIS at 1-800-553-NTIS (6847) or (703) 605-6000 and request the free *NTIS Products Catalog,* PR-827LPG, or visit the NTIS Web site **http://www.ntis.gov**.

NTIS
Your indispensable resource for government-sponsored information—U.S. and worldwide

U.S. DEPARTMENT OF COMMERCE
Technology Administration
National Technical Information Service
Springfield, VA 22161 (703) 605-6000